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10/517,178	12/07/2004	Katsuaki Abe	MAT-8631US	5688

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EXAMINER	
MATTIS, JASON E	

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2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,178	ABE·ET AL.	
	Examiner	Art Unit	
	Jason E. Mattis	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 2 papers.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities:

Each claim is required to end with a period; however, claim 1 appears to contain a typo such that ends with a colon. It is recommended that the colon at the end of claim 1 be removed and a period be inserted in its place.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-7 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Krishnamoorthy et al. (U.S. Pat. 6490270 B1).

With respect to claim 1, Krishnamoorthy et al. discloses a method of receiving data **(See the abstract of Krishnamoorthy et al. for reference to a receiver**

receiving data). Krishnamoorthy et al. also disclose inserting a symbol having a higher modulation level on a symbol basis into a transmission burst formed at transmission **(See column 4 lines 9-38 and Figure 2 of Krishnamoorthy et al. for reference to inserting symbols, including symbols having a higher modulation level, such as 8-PSK, 16-QAM, 32-QAM, and 64-QAM, into a transmission frames at formed at transmission)**. Krishnamoorthy et al. further discloses transmitting the transmission burst including the inserted symbol **(See column 6 line 66 to column 7 line 18 and Figure 4 of Krishnamoorthy et al. for reference to transmitting packets including the higher modulation symbols)**.

With respect to claim 2, Krishnamoorthy et al. discloses a method of receiving data transmitting on a burst signal basis **(See the abstract of Krishnamoorthy et al. for reference to a receiver receiving data transmitted on a time slot burst basis)**. Krishnamoorthy et al. also discloses detecting a symbol in response to a symbol position where the symbol having a higher modulation level and being inserted in the burst signal received is placed and in response to a symbol position where a symbol other than the foregoing symbol is placed **(See column 5 line 47 to column 10 line 65 and Figure 3 of Krishnamoorthy et al. for reference to detecting using a correlation result to detect the position of time slot symbols having higher modulation levels as well as detecting the position of time slot symbols having lower modulation levels)**.

With respect to claim 3, Krishnamoorthy et al. discloses a transmission device of a communication system that carries out communication on a burst basis by digital

modulation **(See the abstract of Krishnamoorthy et al. for reference to a wireless communication system including a transmitter transmitting data on a time slot burst basis)**. Krishnamoorthy et al. also discloses a means for dividing transmission data at a given ration **(See column 4 lines 17-37 and Figure 2 of Krishnamoorthy et al. for reference to dividing transmission data into packets at a given ratio according to selected modulation schemes for each time slot)**. Krishnamoorthy et al. further discloses a first and second mapping means providing a first divided data with a signal space diagram according to a first modulation method and a second divided data with a signal space diagram according to a second higher modulation method respectively **(See column 6 line 66 to column 7 line 17 and Figure 4 of Krishnamoorthy et al. for reference to a means for modulation a first portion of data to be transmitted in a first time slot according to a first modulation scheme as well as a means for modulation a different portion of data to be transmitted in a time slot according to a second higher level modulation scheme)**. Krishnamoorthy et al. also disclose a multiplexing means placing symbols modulated by the first and second modulation method at given places respectively and multiplexing a transmission burst **(See column 3 line 61 to column 4 line 44 and Figure 2 of Krishnamoorthy et al. for reference to multiplexing symbols of time slots having data modulated by the first and second modulation methods respectively into given positions of the same transmission frame)**.

With respect to claim 4, Krishnamoorthy et al. discloses a reception device of a communication system that carries out communication on a burst basis by digital

modulation **(See the abstract of Krishnamoorthy et al. for reference to a receiver receiving digitally modulated data transmitted on a time slot burst basis in a wireless communication system)**. Krishnamoorthy et al. also discloses a reception means for receiving a communication signal then outputting a bust signal **(See column 5 lines 47-67 and Figure 3 of Krishnamoorthy et al. for reference to receiving a signal and outputting a demodulated signal based on the received signal)**. Krishnamoorthy et al. also discloses a dividing means dividing the burst signal received in response to given places **(See column 4 lines 17-37 and Figure 2 of Krishnamoorthy et al. for reference to dividing a received frame in given time slots based on modulation schemes used in the different time slots)**. Krishnamoorthy et al. further discloses a first and second symbol detecting means providing a first divided signal with symbol detection in response to a first modulation method and a second divided signal with symbol detection in response to a second higher level modulation method respectively **(See column 5 line 47 to column 6 line 65 and Figure 3 of Krishnamoorthy et al. for reference to detecting different time slot symbols according to both a first modulation scheme and a second higher level modulation scheme)**. Krishnamoorthy et al. also discloses a multiplexing means for placing symbols detected by the first and second symbol detecting means in a given order and multiplexing a reception data stream **(See column 3 line 61 to column 4 line 44 and Figure 2 of Krishnamoorthy et al. for reference to placing different time slot symbols modulated according to different modulation schemes in a proper order according to a transmitted multiplex data frame)**.

With respect to claims 5 and 6, Krishnamoorthy et al. discloses that when communication quality is different at each symbol position, a symbol having a higher modulation level is assigned to a symbol position of which communication quality is considered in advance better than other symbol positions **(See column 1 lines 48-57, column 6 line 66 to column 7 line 17, and Figure 4 of Krishnamoorthy et al. for reference to determining the communication channel quality for each time slot and for reference to placing symbols having a higher level modulation scheme in time slots determined in advance to have better channel quality)**.

With respect to claim 7, Krishnamoorthy et al. discloses a communication quality information obtaining means obtaining information about whether communication quality is different at each symbol position in the burst **(See column 1 lines 48-57 of Krishnamoorthy et al. for reference to monitoring communication quality for each symbols of each time slot)**. Krishnamoorthy et al. also discloses an insertion place detecting means for assigning a symbol having a higher modulation level to a position of which communication quality is better than other symbol positions according to the information **(See column 6 line 66 to column 7 line 17 and Figure 4 of Krishnamoorthy et al. for reference to placing symbols having a higher level modulation scheme in time slots determined to have better channel quality based on channel quality parameters)**.

With respect to claim 12, Krishnamoorthy et al. discloses inserting known bit data in a part of the symbol having a higher modulation level so that a signal space diagram at a modulation is limited **(See column 4 line 57 to column 5 line 46 of**

Krishnamoorthy et al. for reference to inserting known sequences to be detected by a correlator in order to determine the modulation scheme used so that the signal space diagram is limited to those known sequences and corresponding modulations).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8, 9, and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishnamoorthy et al. in view of Murakami et al. (U.S. Pat. 6993092 B1).

With respect to claim 8, Krishnamoorthy et al. discloses a communication quality information measuring means measuring communication quality at each symbol position in the burst **(See column 1 lines 48-57 of Krishnamoorthy et al. for reference to monitoring communication quality for each symbols of each time slot)**. Krishnamoorthy et al. also discloses an insertion place information obtaining means for obtaining information about a place where a symbol having a higher modulation level is inserted **(See column 5 line 47 to column 6 line 65 and Figure 3**

of Krishnamoorthy et al. for reference to detecting the time slot symbol positions of different modulation schemes including schemes having a higher modulation level). Although Krishnamoorthy et al. does disclose using communication quality information to determine what modulation scheme to use for different symbols, Krishnamoorthy et al. does not specifically disclose a reception device including a notifying means notifying a transmission device of information about a measured communication quality.

With respect to claim 9, Krishnamoorthy et al. discloses a communication system comprising a reception device **(See the abstract of Krishnamoorthy et al. for reference to a wireless communication system including a receiver)**. Krishnamoorthy et al. also discloses a transmission device including a communication quality information obtaining means obtaining information about reception quality **(See column 1 lines 48-57 of Krishnamoorthy et al. for reference to a transmission devices monitoring channel quality)**. Krishnamoorthy et al. further discloses the transmission device including an insertion place detecting means for assigning an insertion place to a symbol position of which communication quality is better than another symbol position based on the reception quality information **(See column 6 line 66 to column 7 line 17 and Figure 4 of Krishnamoorthy et al. for reference to assigning symbols using different modulation schemes to different positions based on the obtained channel quality information)**. Although Krishnamoorthy et al. does disclose using communication quality information to determine what modulation scheme to use for different symbols, Krishnamoorthy et al. does not specifically disclose

a reception device including a notifying means notifying a transmission device of information about a measured communication quality.

With respect to claims 8 and 9, Murakami et al., in the field of communications, discloses a reception device including a measuring means to measure reception quality at each symbol position of a received burst and a notifying means notifying a transmission device of information about the measured communication quality **(See column 3 lines 27-58, column 5 lines 34-41, and Figures 1 and 5 of Murakami et al. for reference to a receiver measuring transmission path distortion of symbols of a received signal and for reference to signaling transmission path distortion to a transmitter)**. Using a reception device including a measuring means to measure reception quality at each symbol position of a received burst and a notifying means notifying a transmission device of information about the measured communication quality has the advantage of providing a means for a transmitter to receive communication channel quality information about data received by a receiver.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Murakami et al., to combine using a reception device including a measuring means to measure reception quality at each symbol position of a received burst and a notifying means notifying a transmission device of information about the measured communication quality, as suggested by Murakami et al, with the system and method of Krishnamoorthy et al., with the motivation being to provide a means for a transmitter to receive communication channel quality information about data received by a receiver.

With respect to claims 13-16, Krishnamoorthy et al. does not specifically disclose estimating reception quality of a signal received using a vector of the signal inserted on a symbol basis received at a symbol position of a higher modulation level placed away by a given Euclidean distance in response to an amplitude of a symbol of a lower modulation method.

With respect to claims 13-16, Murakami et al. discloses estimating reception quality of a signal received using a vector of the signal inserted on a symbol basis received at a symbol position of a higher modulation level placed away by a given Euclidean distance in response to an amplitude of a symbol of a lower modulation method **(See column 5 lines 13-41 and Figures 3-4 of Murakami et al. for reference to estimating reception quality using a signal point layout of a known pilot symbol vector inserted on a symbol basis where a symbol of higher modulation is placed away from a symbol of lower modulation by to a given distance according to a signal point layout)**. Estimating reception quality of a signal received using a vector of the signal inserted on a symbol basis received at a symbol position of a higher modulation level placed away by a given Euclidean distance in response to an amplitude of a symbol of a lower modulation method has the advantage of providing a means to measure signal quality of received data modulated according to different modulation schemes.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Murakami et al., to combine estimating reception quality of a signal received using a vector of the signal inserted on a symbol

basis received at a symbol position of a higher modulation level placed away by a given Euclidean distance in response to an amplitude of a symbol of a lower modulation method, as suggested by Murakami et al, with the system and method of Krishnamoorthy et al., with the motivation being to provide a means to measure signal quality of received data modulated according to different modulation schemes.

6. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishnamoorthy et al. in view of Moon et al. (U.S. Publication US 2003/0021240 A1).

With respect to claims 10 and 11, Krishnamoorthy et al. does not specifically disclose superimposing partial redundant data to be retransmitted to a position of a symbol having a higher modulation level and correcting an error by outputting a redundant section deleted at the coding through another channel, storing the deleted section and supplying the redundant section stored for superimposing the retransmitted partial data.

With respect to claims 10 and 11, Moon et al., in the field of communications, discloses superimposing partial redundant data to be retransmitted to a position of a symbol having a higher modulation level and correcting an error by outputting a redundant section deleted at the coding through another channel, storing the deleted section and supplying the redundant section stored for superimposing the retransmitted partial data **(See page 3 paragraph 21 to page 4 paragraph 27 and Figure 5 of Moon et al. for reference to transmitting partial redundant data at a higher modulation**

rate and combining received partial redundant data with stored deleted data of the originally transmitted data). Superimposing partial redundant data to be retransmitted to a position of a symbol having a higher modulation level and correcting an error by outputting a redundant section deleted at the coding through another channel, storing the deleted section and supplying the redundant section stored for superimposing the retransmitted partial data has the advantage of allowing data errors to be efficiently corrected through data retransmission.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Moon et al., to combine superimposing partial redundant data to be retransmitted to a position of a symbol having a higher modulation level and correcting an error by outputting a redundant section deleted at the coding through another channel, storing the deleted section and supplying the redundant section stored for superimposing the retransmitted partial data, as suggested by Moon et al, with the system and method of Krishnamoorthy et al., with the motivation being to allow data errors to be efficiently corrected through data retransmission.

7. Claims 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishnamoorthy et al. in view of Shahar et al. (U.S. Publication US 2003/0002495 A1).

With respect to claims 17, 19, 21, and 23, Krishnamoorthy et al. does not specifically disclose generating a transmission packet which outputs information about a size of the packet and detecting a quantity and insertion place of a symbol having a

higher modulation level based on the information about a size of the transmission packet for controlling data separation.

With respect to claims 18, 20, 22, and 24, Krishnamoorthy et al. does not specifically disclose that the information about the packet size is inserted in the transmission burst.

With respect to claims 17-24, Shahar et al., in the field of communications, discloses generating a transmission packet which outputs information about a size of the packet and detecting a quantity and insertion place of a symbol having a higher modulation level based on the information about a size of the transmission packet for controlling data separation **(See page 1 paragraphs 13-14, page 7 paragraphs 62-63, and Figures 3 and 4 of Shahar et al. for reference to a data stream being divided into data packets 220 containing a header 240 including information about a modulation type 300 and a length 310 of a data field 250 and for reference to a receiver using the information about the modulation type and the length to reconstruct a packet by determining a quantity and insertion place of data having a higher modulation level)**. Generating a transmission packet which outputs information about a size of the packet and detecting a quantity and insertion place of a symbol having a higher modulation level based on the information about a size of the transmission packet for controlling data separation has the advantage of allowing more customization of transmitted data for more efficient transmission of data by allowing for different packet data lengths.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Shahar et al., to combine generating a transmission packet which outputs information about a size of the packet and detecting a quantity and insertion place of a symbol having a higher modulation level based on the information about a size of the transmission packet for controlling data separation, as suggested by Shahar et al, with the system and method of Krishnamoorthy et al., with the motivation being to allow more customization of transmitted data for more efficient transmission of data by allowing for different packet data lengths.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E. Mattis whose telephone number is (571) 272-3154. The examiner can normally be reached on M-F 8AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason E Mattis
Examiner
Art Unit 2616

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